

REMARKS

Claims 1, 13, 21 and 23-25 have been amended. Claim 1 has been amended to incorporate the subject matter of claim 11. Claims 21, and 23-25 have been amended to provide proper antecedent basis. Support for the amendments can be found throughout the specification, for example in the drawings. Claim 11 has been cancelled. No new matter has been added. Claims 1-29 are pending. Claims 1, 13, 21, 23 and 28 are independent.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 21-27 have been rejected under 35 U.S.C § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claims 21-27 have been rejected for failure to provide proper antecedent basis for "the maximum dimension" and for relying on reference character D. More specifically, the Examiner asserts that, "While reference characters are allowable within the claims, the claim language should particularly point out and distinctly claim the subject matter without having to refer to the drawings via reference characters." Claims 21 and 23 are independent.

Applicant has amended claims 21 and 23-25 to provide proper antecedent basis. With respect to reference character D, Applicant disagrees with the Examiner's assertion. D is fully defined within the language of the claims as a dimension of an inner member normal to the flow path through each of the pivot joint assemblies' inlet and outlet. The magnitude of D changes along the flow path within the inner member and has a maximum and a minimum. There is no requirement in the claim to refer to the drawings; the language is particular, distinct and specific. Claims 22, 26 and 27 have not been amended because they were rejected only because of their dependencies.

Rejections under 35 U.S.C. § 103

Claims 1-29 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,776,617 to Sato ("Sato"). Claims 1, 13, 21, 23 and 28 are independent.

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Claim 1 and claims that depend therefrom

Applicants have discovered a flexible joint assembly for conducting liquid with an inlet and an outlet and a flow path between the inlet and the outlet that includes a first and second pivot joint and a central fluid conductor coupling the two pivot joints where the pivot joints provide a greater than 60° bend between the inlet and the outlet and each pivot joint independently provides greater than a 35° bend in the fluid flow path. See amended independent claim 1.

The Examiner asserts that though it does not explicitly state that the pivot joints together provide a greater than 60° bend between the inlet and the outlet, that such a bend is within the scope of Sato's disclosure. See Office Action at page 3. Applicant respectfully disagrees. The telescoping device of Sato is not designed to pivot at each joint beyond approximately 15°. See Figure 8 of Sato. This is necessarily the case for two important reasons. The design of Sato prevents a greater bend at each pivot and the purpose of Sato's device is defeated by a pivot that is greater than the approximately 15° provided. See Figure 8 of Sato. Sato has a built-in pivot stop that prevents pivoting beyond the 15° it is designed to pivot. See for example the raised ridge adjacent to the arrowhead of 200a in Figure 8 of Sato. This raised ridge limits the pivot arc of the design. This limit in the pivot arc is included to prevent the device from pivoting too far and breaking and allows for a compressive force to be absorbed, in part, by the telescoping action of the device. See Figure 8 of Sato. If the device pivoted too far it would no longer efficiently absorb a compressive force through its telescoping action because the direction of the forces would be directed more towards creating a torque rather than to compressing the device. Thus, Sato does not teach or suggest a device that pivots more than approximately 15°, and one skilled in the art would not be motivated by Sato's design to create such a device because it would defeat the telescoping action of the Sato device.

The Examiner asserts that Sato clearly shows an angle (A) between the centerline of inlet 201a and the centerline of element 202a that appears to be well in excess of 60° and that Figure 8 shows that the inlet and outlet can be positioned parallel¹ to each other thus creating an angle greater than 60°. See Office Action at page 3. Unfortunately, Examiner has failed to consider

¹ Applicant assumes that by parallel the examiner means in one straight line.

the angle described by claim 1. The angle described in claim 1 is between the inlet and the outlet. The angle asserted by the Examiner is just the angle between the inlet and the telescoping element. To achieve the claimed angle (that between the inlet and the outlet) the Examiner needs to add the angle between the telescoping element all the way around to the centerline of the outlet. This gives the angle between the inlet and the telescoping element plus the angle between the telescoping element and the outlet or the angle between the inlet and the outlet. The difference between this sum and a horizontal is the angle between the inlet and the outlet as claimed by Applicants. Sato's device cannot achieve this angle at a value approaching 60°. See Figure 8. As for the parallel Figure 8 comment, again here the angle is 0° or no angle between inlet and outlet. The device in Sato does not teach or suggest Applicant's discovery and would not motivate one skilled in the art to replicate Applicant's discovery.

Furthermore, Sato's device does not allow each pivot joint to independently provide greater than a 35° bend in the fluid flow path. Again, the pivot stop caused by the raised ridge at each pivot joint of Sato prevents the joints of Sato from pivoting through such an arc independently. See Figure 8 of Sato. Sato does not teach, suggest or motivate one skilled in the art to design such a device with this magnitude of pivot in each joint individually, for the same reasons discussed previously regarding the purpose and function of Sato and Sato's telescoping central member.

Claim 1 and the claims that depend from it are patentable. Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 13 and 28 and claims that depend therefrom

With respect to claims 13 and 28, Applicant has discovered a flexible joint assembly that includes a first joint, a second joint and a unitary central fluid connector connecting the first joint and the second joint.

The Examiner asserts that figure 8, element 204a is a unitary central fluid connector because it connects the first and second ball joints, is constructed as one piece and is hollow to allow fluid flow within. See Office Action at page 11. Applicant disagrees. Figure 8 shows that the central fluid connector in Sato is constructed out of three pieces, not 1, and is thus not a unitary central fluid connector. These pieces are 202a and 202b and a connector not assigned a

number that screws onto 202b creating a seal between outer tube 202b and inner tube 202a. Tube 202a can slide within tube 202b (thus the telescoping action of the design). Element 204a is the cylindrical portion of element 202a, but it does not extend completely between the ball joints. It stops at least a distance "1" from where 202b narrows before entering the ball joint. This is necessary to allow the telescoping action of the device without damaging elements 202b and 202a by ramming the end of 202a into the tapering shoulder of 202b. Thus, Sato teaches a non-unitary central connector. Sato does not teach, suggest or motivate one skilled in the art to use a unitary central fluid connector because of the inherent properties in Sato's design and the intended use of Sato, including its telescoping nature.

Independent claims 13 and 28 and the claims that depend therefrom are patentable over Sato. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 21 and claims that depend therefrom

With respect to independent claim 21, Applicant has discovered a flexible joint assembly with an inlet and an outlet and a fluid flow path between the inlet and the outlet. The fluid flow path is configured with a first pivot joint to pivot around a first pivot and a second pivot joint configured to pivot around a second pivot with a central fluid conductor connecting the first and second pivot joints. Each pivot joint includes an inner member with a dimension D in a direction that is normal to the joint assembly inlet and outlet, a receiving member that is dimensioned to receive at least part of the inner member, and **a sealing member that seals the inner member to the receiving member at a distance of less than 14% of a maximum of dimension D from the pivot.**

Claim 21 has been amended to more clearly describe dimension D. See Office Action at pages 2 and 7. Dimension D is defined as the dimension of the inner member that is normal to the flow path. It has a maximum and a minimum size based on the size of the inner member. As the position along the flow path within the inner member changes, the magnitude of the dimension D can change, but it can never be larger than the inner member at that point along the flow path. Since Dimension D is a dimension of the inner member it cannot be larger than the inner member normal to a given point along the flow path as suggested by the Examiner nor smaller than the dimension of the inner member normal to that point of the flow path. Sato does not suggest or teach a sealing member that seals the inner member to the receiving member at a

distance of less than 14 % of the maximum of dimension D from the pivot. Sato does not even mention having a sealing member at all let alone relating the position of a sealing member to the size of the inner member. Sato does not motivate one skilled in the art to provide a sealing member at a distance of less than 14% of the maximum dimension D from the pivot.

Claim 21 and the claims that depend from it are patentable. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 23 and claims that depend therefrom

With respect to independent claim 23, Applicant has described a flexible joint assembly with an inlet and an outlet connected by a fluid flow path. The joint assembly includes a contact point between each receiving joint member and the central fluid conductor whereby the pivot joint is fully pivoted over the respective arc within 75% of a maximum dimension D distant from the respective pivot.

Sato does not disclose a joint assembly that includes a contact point between each receiving joint member and the central fluid conductor whereby the pivot joint is fully pivoted over the respective arc within 75% of a maximum dimension D distant from the respective pivot. Sato does not suggest a relationship between the inner member dimension D and the pivot arc. Sato does not teach an inner member with dimension D. Instead Sato includes pivot stops to limit the amount of pivot at each joint to approximately 15°. See Figures 8 and 9 of Sato. The contact point between the central fluid conductor and the receiving joint member is the point whereby the pivot joint is fully pivoted. Sato includes separate pivot stops because Sato's device would not function properly if it were allowed to pivot to the extent that Applicant's discovery does. Indeed because of its intended use, Sato would not motivate one skilled in the art to provide a device that pivots as Applicant's device does because Sato's device is intended to telescope when under compressive stress and such telescoping action would be essentially defeated if the device were allowed to pivot as Applicant's device does.

Independent claim 23 and the claims that depend from it are patentable over Sato. Applicant respectfully requests reconsideration and withdrawal of this rejection.

CONCLUSION

Applicant requests that all claims be allowed.